and compare the object's proximity to the new threshold. Optionally, the device may also reset the predetermined factor to a different value. When the device decreases the pixel size, the device may dynamically subdivide each of the preceding formed subgroups of pixels by the predetermined size factor to form new smaller pixel subgroups until no further size adjustment may be needed. Alternatively, when the device adjusts the pixel shape, the device may dynamically adjust the preceding shape of pixels according to the predetermined shape factor to form new shapes until no further shape adjustment may be needed.

[0060] FIGS. **8***a*, **8***b*, **8***c*, **8***d*, and **8***e* are exemplary illustrations of a sensor panel having dynamically reconfigurable sensor size and shape according to a predetermined factor based on an object's proximity to the panel according to embodiments of the invention. FIGS. **8***a*, **8***b*, **8***c*, **8***d*, and **8***e* illustrate the method of FIG. **7**. In FIG. **8***a*, sensor panel **800** of a device may have a larger pixel size and square shape **810** in which all of the pixels are interconnected. Object **820**, e.g., a hand, may be a distance d, from sensor panel **800**. As object **820** approaches panel **800**, as some point, the panel may detect the object. When panel **800** detects object **820**, the device may determine the object's proximity to the panel and continue to do so as the object approaches. The device may compare the object's proximity to a predetermined proximity threshold.

[0061] Suppose a distance d_2 is the predetermined proximity threshold, where $d_2<d_1$. In FIG. **8***b*, when object **820** reaches a proximity to panel **800** that approximately matches the threshold, the device may subdivide the pixels by a predetermined size factor. The predetermined factor may be any integer. Here, the predetermined factor is four, such that the panel may form four pixel subgroups. Hence, panel **800** may have a smaller pixel size **815** by a factor of 4. All the pixels in a subgroup may be interconnected to form a single pixel.

[0062] Suppose the device determines that further pixel size adjustment is needed. The device may reset the predetermined proximity threshold to a lower distance value, such as d_3 where $d_3<d_2$. In FIG. **8***c*, when object **820** reaches a proximity to panel **800** that approximately matches the resetted threshold, the device may subdivide the pixels in each subgroup by the predetermined size factor. Here, the predetermined factor is unchanged at four, such that each subgroup may be subdivided into four new subgroups making a total of sixteen subgroups. Hence, panel **800** may have a smaller pixel size **820** by a factor of 4. All the pixels in a subgroup may be interconnected to form a single pixel.

[0063] Alternatively, in FIG. **8***d*, when object **820** reaches a proximity to panel **800** that approximately matches the threshold d_2, the device may dynamically reconfigure the pixels according to a predetermined shape factor. Here, the predetermined shape factor is a rectangle. Hence, panel **800** may have a rectangular pixel shape **840**. All the pixels within the rectangle may be interconnected to form a single pixel. In FIG. **8***e*, when object **820** reaches a proximity to panel **800** that matches the resetted threshold d_3, the device may dynamically reconfigure the pixels according to a predetermined shape factor. Here, the predetermined shape factor is a circle. Hence, panel **800** may have a circular pixel shape **850**. All the pixels within the circle may be interconnected to form a single pixel.

[0064] In some embodiments, both pixel size and shape may be dynamically reconfigured as the proximity of object **820** to panel **800** changes.

[0065] FIG. **9** illustrates an exemplary method for dynamically reconfiguring sensor size and shape of a sensor panel based on a gesture detected by the panel according to embodiments of the invention. Initially, a device having a sensor panel with dynamically reconfigurable sensor size and shape may adjust the sensing pixels to a certain size and/or shape. The size and/or shape may be any size and/or shape sufficient to detect the presence of an object. The panel may sense a touch or proximity event, i.e., an object may be either touching or proximate to the panel (**905**). The device may recognize the event as a gesture using any known gesture recognition technique (**910**). Based upon recognized characteristics of the gesture, the device may dynamically adjust the initial pixel size and/or shape (**915**). Examples of gesture characteristics that may be recognized include a hand or finger motion, position, and velocity perpendicular or parallel to the panel.

[0066] To adjust the pixel size and/or shape, the panel may select a particular portion of the panel in which to adjust the size and/or shape. The portion may be the entire panel or any portion of the panel, such as the portion in which the event is sensed. The device may adjust the pixel size and/or shape in the selected portion based on the recognized gesture characteristic. For example, the device may decrease the pixel size as the hand or finger position gets closer to the panel in order to detect where the hand or finger is targeting the panel. The device may decrease the pixel size as the hand or finger motion becomes more complex in order to correctly recognize what the gesture is. The device may decrease the pixel size as the hand or finger velocity increases in order to correctly track the gesture. Alternatively, the device may increase the pixel size for these characteristics if it is appropriate to do so. The device may change the pixel shape if the hand or finger position is limited to only a specific portion of the panel. The device may change the pixel shape if the hand or finger motion makes a certain shape. The device may change the pixel shape if the hand or finger velocity changes.

[0067] FIGS. **10***a* and **10***b* are exemplary illustrations of a sensor panel having dynamically reconfigurable sensor size and shape based on a gesture detected by the panel according to embodiments of the invention. FIGS. **10***a* and **10***b* illustrate the method of FIG. **9**. In FIG. **10***a*, sensor panel **1000** may have an initial pixel size **1010**. Hand **1020** may be proximate to panel **1000**. In FIG. **10***b*, hand **1020** may perform a pinching gesture **1025** in which the thumb and forefinger move together. Sensor panel **1000** may sense hand **1020** as a proximity event. The device having sensor panel **1000** may recognize pinching gesture **1025**. The device may determine that only certain portions of panel **1000** need be adjusted to have a different pixel size corresponding to the estimated positions of the thumb and forefinger performing the gesture. Therefore, the device may decrease pixel sizes **1030** and **1040** in selected portions of panel **1000**. Pixel sizes **1030** and **1040** may be the same or different.

[0068] In this example, the pixel shape is unchanged. However, in some embodiments, the pixel shape may be dynamically reconfigured to better detect the pinching gesture, for example.

[0069] FIG. **11** illustrates an exemplary method for dynamically reconfiguring sensor size and shape of a sensor panel based on an application according to embodiments of the invention. Initially, a device having a sensor panel with dynamically reconfigurable sensor size and shape may adjust the sensing pixels to a default size and/or shape. The size and/or shape may be any size and/or shape sufficient to detect